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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/695,415	10/29/2003	Hidenori Kawanishi	204552030500	5623

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MORRISON & FOERSTER LLP
1650 TYSONS BOULEVARD
SUITE 300
MCLEAN, VA 22102

EXAMINER	
VAN ROY, TOD THOMAS	
ART UNIT	**PAPER NUMBER**
2828	

DATE MAILED: 09/08/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

AK

Office Action Summary	Application No.	Applicant(s)	
	10/695,415	KAWANISHI ET AL.	
	Examiner	Art Unit	
	Tod T. Van Roy	2828	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-26 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-26 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 10/29/03,12/27/04. 6/22/05 IDS
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Priority

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Specification

The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 10, 11, 20, 21, and 24 are rejected under 35 U.S.C. 102(b) as being anticipated by Yasuhiko et al. (JP-2000-340894, submitted by applicant).

With respect to claim 1, Yasuhiko discloses a semiconductor laser device comprising: a substrate (fig.1 #1)); a first conductivity-type (denoted as n) lower clad layer deposited (fig.1 #4) on the first conductivity-type semiconductor first conductivity-type semiconductor substrate; a quantum well active layer deposited on the first conductivity-type lower clad layer and composed of a barrier layer and a well layer alternately stacked ([0032]); and a second conductivity-type (denoted

as p) upper clad layer (fig.1 #10) deposited on the quantum well active layer, wherein the quantum well active layer is doped with second conductivity type impurity ([0066], Zn).

With respect to claim 10, Yasuhiko discloses the laser device outlined in claim 1, and further discloses the use of the laser device as the source in an optical disk unit ([0002]).

With respect to claim 11, Yasuhiko discloses a semiconductor laser device comprising: a substrate (fig.1 #1)); a first conductivity-type (denoted as n) lower clad layer deposited (fig.1 #4) on the first conductivity-type semiconductor first conductivity-type semiconductor substrate; a quantum well active layer deposited on the first conductivity-type lower clad layer and composed of a barrier layer and a well layer alternately stacked ([0032]); and a second conductivity-type (denoted as p) upper clad layer (fig.1 #10) deposited on the quantum well active layer, wherein the quantum well active layer is doped with first conductivity type impurity ([0032], Si).

With respect to claim 20, Yasuhiko discloses the laser device outlined in claim 1, and further discloses the use of the laser device as the source in an optical disk unit ([0002]).

With respect to claim 21, Yasuhiko discloses a manufacturing method of a semiconductor laser device, comprising: depositing first conductivity-type lower clad layer on a first conductivity-type semiconductor substrate (n-type [0040]); depositing a quantum well active layer being composed of a barrier layer and a well layer alternately stacked ([0032]); and depositing a second conductivity-type

upper clad layer on the quantum well active layer (p-type [0040]), wherein the quantum well active layer grown while being doped with a second conductivity type of impurity (Zn [0066], [0043-44]).

With respect to claim 24, Yasuhiko discloses a manufacturing method of a semiconductor laser device, comprising: depositing first conductivity-type lower clad layer on a first conductivity-type semiconductor substrate (n-type [0040]); depositing a quantum well active layer being composed of a barrier layer and a well layer alternately stacked ([0032]); and depositing a second conductivity-type upper clad layer on the quantum well active layer (p-type [0040]), wherein the quantum well active layer grown while being doped with a first conductivity type of impurity (Si [0032], [0043]).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.

2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 2-5, 12-15, 22-23, and 25-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yasuhiko in view of Fukunaga et al. (EP 0 920 096 A2, submitted by applicant).

With respect to claim 2, Yasuhiko teaches the laser device as outlined in the rejection to claim 1 above, but does not teach the active layer to be made of InGaAsP material and emitting between 760-800nm. Fukunaga teaches a semiconductor laser device using InGaAsP well and barrier layers (abs.) and emits within the specified range ([0104]). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the laser device of Yasuhiko with the active layer material of Fukunaga in order to achieve emission on the order of 780nm, which is well known in the art to be used in recording mediums such as optical discs. In addition, it would have been obvious to one having ordinary skill in the art at the time the invention was made to make the laser of these known materials, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 227 F.2d 197, 125 USPQ 416 (CCPA 1960).

A reference noted, but not relied upon for this rejection is Shiomoto et al. (US 6456635) that speaks of this wavelength regime being useful for optical discs (col.1 lines 20-54).

With respect to claim 3, Yasuhiko and Fukunaga teach the laser device as outlined in the rejection to claim 2, and Yasuhiko further teaches the Zn doping (and all impurity dopants) to be 2x10^17 cm-3 or less ([0011]).

With respect to claim 4, Yasuhiko and Fukunaga teach the laser device as outlined in the rejection to claim 2, and Yasuhiko further teaches a guide layer made of AlGaAs-based material and interposed between the quantum well active layer and the upper clad layer (fig.1 #8) and between the quantum well active layer and the lower clad layer (fig.1 #6).

With respect to claim 5, Yasuhiko and Fukunaga teach the laser device as outlined in the rejection to claim 4, and Yasuhiko further teaches the mixed crystal ratio of the Al in the guide layers is larger than .2 (table 1, each amount is .35).

With respect to claim 12, Yasuhiko teaches the laser device as outlined in the rejection to claim 11 above, but does not teach the active layer to be made of InGaAsP material and emitting between 760-800nm. Fukunaga teaches a semiconductor laser device using InGaAsP well and barrier layers (abs.) and emits within the specified range ([0104]). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the laser device of Yasuhiko with the active layer material of Fukunaga in order to achieve emission on the order of 780nm, which is well known in the art to be used in recording mediums such as optical discs. In addition, it would have been obvious to one having ordinary skill in the art at the time the invention was made to make the laser of these known materials, since it has been held to be within the general

skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 227 F.2d 197, 125 USPQ 416 (CCPA 1960).

A reference noted, but not relied upon for this rejection is Shiomoto et al. (US 6456635) that speaks of this wavelength regime being useful for optical discs (col.1 lines 20-54).

With respect to claim 13, Yasuhiko and Fukunaga teach the laser device as outlined in the rejection to claim 12, and Yasuhiko further teaches the Zn doping (and all impurity dopants) to be 2x10^17 cm-3 or less ([0011]).

With respect to claim 14, Yasuhiko and Fukunaga teach the laser device as outlined in the rejection to claim 12, and Yasuhiko further teaches a guide layer made of AlGaAs-based material and interposed between the quantum well active layer and the upper clad layer (fig.1 #8) and between the quantum well active layer and the lower clad layer (fig.1 #6).

With respect to claim 15, Yasuhiko and Fukunaga teach the laser device as outlined in the rejection to claim 14, and Yasuhiko further teaches the mixed crystal ratio of the Al in the guide layers is larger than .2 (table 1, each amount is .35).

With respect to claim 22, Yasuhiko teaches the method as outlined in the rejection to claim 21 above, but does not teach the active layer to be made of InGaAsP material and emitting between 760-800nm. Fukunaga teaches a semiconductor laser device formed using InGaAsP well and barrier layers (abs., [0025]) and emits within the specified range ([0104]). It would have been obvious

to one of ordinary skill in the art at the time of the invention to combine the method of Yasuhiko with the active layer material formation of Fukunaga in order to achieve emission on the order of 780nm, which is well known in the art to be used in recording mediums such as optical discs. In addition, it would have been obvious to one having ordinary skill in the art at the time the invention was made to make the laser of these known materials, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 227 F.2d 197, 125 USPQ 416 (CCPA 1960).

A reference noted, but not relied upon for this rejection is Shiomoto et al. (US 6456635) that speaks of this wavelength regime being useful for optical discs (col.1 lines 20-54).

With respect to claim 23, Yasuhiko and Fukunaga teach the laser device as outlined in the rejection to claim 22, and Yasuhiko further teaches the Zn doping (and all impurity dopants) to be 2x10^17 cm-3 or less ([0011]).

With respect to claim 25, Yasuhiko teaches the method as outlined in the rejection to claim 24 above, but does not teach the active layer to be made of InGaAsP material and emitting between 760-800nm. Fukunaga teaches a semiconductor laser device formed using InGaAsP well and barrier layers (abs., [0025]) and emits within the specified range ([0104]). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the method of Yasuhiko with the active layer material formation of Fukunaga in order to achieve emission on the order of 780nm, which is well known in the art to be

used in recording mediums such as optical discs. In addition, it would have been obvious to one having ordinary skill in the art at the time the invention was made to make the laser of these known materials, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 227 F.2d 197, 125 USPQ 416 (CCPA 1960).

A reference noted, but not relied upon for this rejection is Shiomoto et al. (US 6456635) that speaks of this wavelength regime being useful for optical discs (col.1 lines 20-54).

With respect to claim 26, Yasuhiko and Fukunaga teach the laser device as outlined in the rejection to claim 22, and Yasuhiko further teaches the Si doping (and all impurity dopants) to be 2x10^17 cm-3 or less ([0011]).

Claims 6-9 and 16-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yasuhiko in view of Fukunaga and further in view of Fukunaga (US 2002/0044584).

With respect to claims 6-9, Yasuhiko and Fukunaga teach the device outlined in the rejection to claim 2 above, but do not teach the well layer to have compressive strain at or below 3.5%, or the barrier layers to have tensile strain at or below 3.5%. Fukunaga '584 teaches an InGaAsP active region wherein the quantum well is compressively strained below 3.5% ([0013] product of strain and thickness taught to be .25nm or *smaller*), while the barrier layers are tensile strained below 3.5% ([0015] product of strain and thickness taught to be .25nm

or *smaller*). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the laser device of Yasuhiko and Fukunaga with the strained layers of Fukunaga '584 in order to improve threshold current and reliability (Fukunaga '584, [0033]).

With respect to claims 16-19, Yasuhiko and Fukunaga teach the device outlined in the rejection to claim 12 above, but do not teach the well layer to have compressive strain at or below 3.5%, or the barrier layers to have tensile strain at or below 3.5%. Fukunaga '584 teaches an InGaAsP active region wherein the quantum well is compressively strained below 3.5% ([0013] product of strain and thickness taught to be .25nm or *smaller*), while the barrier layers are tensile strained below 3.5% ([0015] product of strain and thickness taught to be .25nm or *smaller*). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the laser device of Yasuhiko and Fukunaga with the strained layers of Fukunaga '584 in order to improve threshold current and reliability (Fukunaga '584, [0033]).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tod T. Van Roy whose telephone number is (571)272-8447. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Minsun Harvey can be reached on (571)272-1835. The

fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TVR

MINSUN OH HARVEY
PRIMARY EXAMINER